

REMARKS

This communication is in response to the Office Action mailed on February 23, 2007. In the Office Action, claims 1, 2, 6, 7, 10, 13-29, 33-39 and 43-47 were pending.

Claim Rejections – 35 U.S.C. § 101

Claims 1-2, 25, 35, 6-7, 10, 13-29, 33-39 and 43-47 were rejected under 35 U.S.C. § 101 because they fail to recite a concrete, practical, and tangible end result. Applicants respectfully disagree and this rejection simply does not follow The United States Patent and Trademark Office Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (the Guidelines), issued in the Official Gazette Notice of November 22, 2005. In the Guidelines, it is stated that:

"To satisfy §101 requirements, the claim must be practical application of the §101 judicial exception, which can be identified in various ways:

- The claimed invention "transforms" an article or physical object to a different state or a thing.
- The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below." (The Guidelines § IV, C, 2).

The definition of a useful, concrete and tangible result is found in the guidelines. For a result to be "useful" it must satisfy the utility requirement of §101. The United States Patent and Trademark Office's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial, and (iii) credible. (The Guidelines § IV, C, 2, b (1)). A result is "concrete" if it can be assured. "In other words, the process must have a result that can be substantially repeatable or the process must substantially produce the same results again." (The Guidelines § IV, C, 2, b, (3)). A result is "tangible" if it produces "a real world result." (Interim Guidelines § IV, C, 2, b (2)).

An example of a useful, concrete and tangible result is found in *State Street Bank and Trust Company v. Signature Financial Group Inc.*, 149 F.3d 1368, 47 USPQ 2d 1596 (Fed. Cir. 1998), the case which first set this standard. In *State Steet*, it was stated that "[t]he

transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula or calculation because it produces a useful, concrete and tangible result - a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." Thus, the court did not care that a mathematical algorithm was used, only that the end result, the share price, was a useful, concrete and tangible result.

Applicants are unclear as to how an image is not a useful, concrete and tangible result. As provided by the Examiner, it is known that images can be displayed on a screen. Thus, an image, as an end result provides a result that is useful (for display), concrete (repeatable) and tangible (a real world result). It is inconceivable that a person skilled in the art would deem an image as not falling under these three definitions. Images are utilized every day in various situations including processing, displaying, sending across networks, etc. Furthermore, Applicants fail to see how a share price provides more of a useful, concrete and tangible result than an image. For these reasons, Applicants submit that generating an image provides a useful, concrete and tangible result as supported by the Interim Guidelines as well as relevant U.S. case law. Withdrawal of this rejection is respectfully requested.

Claim Rejections – 35 U.S.C. § 112

Claims 1, 25 and 36 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Office Action objected to the language, "without discontinuities". With this amendment, these claims have been amended to recite, "without natural color discontinuities" as disclosed in the specification on page 20, line 13-18. This language appears to provide a clear understanding for "discontinuities" and provides a basis to meet the requirements of 35 U.S.C. § 112. As a result, withdrawal of this rejection is requested.

Claim Rejections – 35 U.S.C. § 103

Claims 1-2, 7, 24-25 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pighin et al. ("Synthesizing Realistic Facial Expressions from Photographs") in view of Simon et al. (U.S. Patent Application 2003/0223622) and Lanitis et al. ("Automatic interpretation and coding of face images using flexible models"). The Office Action notes that recitation of "a single frame of a synthesized image" in the preamble is an intended use that need not be given patentable weight. However, the Office Action ignores further reference to "the" frame throughout the claim. Thus, "the single frame" should be given patentable weight. Claims 1, 25 and 35 are independent. For reasons discussed below, it is believed that these claims are allowable over the prior art.

Amended independent claim 1 recites a computer-implemented method for rendering a single frame of a synthesized image. The method includes generating a geometric component corresponding to a selected image for the single frame based on identified feature points from a set of representative images. Each image of the set has the identified feature points. Also, the geometric component is a dimensional vector of feature point positions. The method also includes generating the selected image for the single frame from a composite of the set of representative images based on the geometric component. The selected image and each of the set of representative images includes a plurality of subregions defined adjacent to each other. Adjacent subregions share a common boundary. A geometric component is generated for each subregion and the composite of the set of representative images is based on the corresponding geometric component for each subregion. The selected image includes a synthesized subregion for each subregion based on the composite and is rendered by blending at least some boundaries between adjacent subregions in the selected image without natural color discontinuities in order to generate the selected image.

Amended independent claim 25 recites a computer-implemented method of rendering a single frame of a synthesized image based on feature points. The method includes accessing a set of stored representatives of various images. Each image of the set of the images has the same corresponding feature points associated therewith. A position of at least one feature

point is ascertained from a change in position of another feature point based on a change in movement of the selected feature point and based on the set of stored representatives of various images. A new image for the single frame is rendered with two or more feature points having changed position. The new image and each image in the set of stored representatives of various images includes a plurality of subregions defined adjacent to each other. Adjacent subregions share a common boundary. The step of rendering also includes rendering the new image with a synthesized subregion for each subregion by blending at least some boundaries between adjacent subregions in the new image. Blending occurs along boundaries without natural color discontinuities to generate the new image.

As amended, independent claim 35 recites a computer-implemented method for rendering a single frame of a synthesized facial image based on feature points. A facial image is rendered with identified feature points and information indicative of a user moving a selected feature point is received. A set of stored representatives of various facial images is accessed. Each image of the set of stored images has a same corresponding feature points associated therewith. A position of at least one feature point from a change in position of another feature point is ascertained based on a change of movement of the selected feature point and based on the set of stored representatives of various facial images. A new facial image for the single frame is rendered with two or more feature points having changed position. The new image in each facial image in the set of stored representatives are various facial images includes a plurality of subregions adjacent to each other. Adjacent subregions share a common boundary. A synthesized subregion is rendered for each subregion in the new image by blending at least some boundaries between adjacent subregions in the new image without natural color discontinuities in order to generate the new image.

Pighin et al. describe techniques for synthesizing realistic facial expressions from photographs. For example, a surprised expression image and a sad expression image can be combined to produce a worried expression image. Additionally, Pighin et al. describe blending of texture values from different photographs. This blending is based on separate images and does not teach or suggest the blending recited in claims 1, 25 and 35. In these claims, blending is

provided for the image for boundaries without natural color discontinuities. Pighin et al. describe blending between frames and do not take into account natural color discontinuities in the same frame. Thus, the Office Action has failed to present objective evidence of blending boundaries for the image without natural color discontinuities therebetween.

Similarly, Simon et al. describe blending of separate images, but do not teach or suggest blending regions that share a common boundary and that do not have natural color discontinuities. Simon et al. merely discuss enhancing a facial image and do not discuss blending regions without natural color discontinuities. Instead, a broad meaning is implied from blending discussed in Pighin et al. and Simon et al. Clearly, there is simply no objective evidence that describes blending of two adjacent regions without natural discontinuities, for example a skin region sharing a boundary with another skin region. Instead, the Office Action discusses that it is obvious to blend adjacent regions. However, the blending techniques discussed are clearly not provided for blending between adjacent subregions that share a common boundary and that are without natural color discontinuities. Thus, independent claims 1, 25 and 35 are believed to be allowable.

Claims 6, 10, 13-14, 26 and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pighin et al. in view of Simon and further in view of Cosatto et al. ("Photorealistic Talking Heads from Image Samples"). Additionally, claims 15-23, 27-29, 33-34, 37-39 and 43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pighin et al., Simon and Cosatto et al. and further in view of Chai et al. ("Vision-based control of 3D animation"). Claims 44 and 47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pighin et al. and Simon and further in view of Nielsen (U.S. Patent No. 6,591,011). Also, claim 45 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Pighin et al. and Simon and further in view of Stewart et al. (U.S. Patent Application 2003/0190091) and claim 46 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Pighin et al., Simon and Stewart et al. and further in view of Fogel et al. (U.S. Patent No. 5,991,459). These claims are believed to be separately patentable when combined with their respective independent claims. As such, these claims are believed to be allowable.

Applicants further note that Nielsen is further silent with respect to blending between adjacent subregions without natural discontinuities. Thus, the pending claims appear to be allowable over Nielsen.

In view of the foregoing, Applicant's submit that the present Application is in condition for allowance. Favorable action is requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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